REMARKS

DRAWINGS

The objections to the drawings have been noted, and the drawings have been corrected to show every feature specified in the claims.

Specifically, the control mechanism connected to the mechanical load as recited in claim 1; - the mechanical load other than a generator has been deleted from the claims, without prejudice and as a generator it is shown in Fig. 1a, 1b, etc. The control mechanism 19, or 39 features in many of the Figures now. The look-up tables as recited in claim 4; these have been replaced with "graphical and mathematical techniques" which are a prior art feature of the control mechanism, which is part of Fig. 1a and other figures.. The variable displacement pump and the displacement adjuster as recited in claim 12; these have been cancelled from the claims, without prejudice. The direct current generator and the electronic converter having control over the own input voltage as recited in claim 15; the claim has been rewritten, in which the electronic converter is described as a power electronic load to conform with the specification, and this features in Figs 1a, 1b, 8a and 8b. The direct current generator and the alternating current generator as recited in claim 16 feature as the generator in Fig. 1a and other figures.. The electronic converter having control over the own input voltage as recited in claim 16; - the claim has been rewritten, and the electronic converter has been referred to in the specification and now in the claims as well, as a power electronic load, and features in Fig. 1a and in detail in Figs. 8. The alternating current generator and the electronic converter, having control over the frequency as recited in claim 17; - the embodiment features in Fig. 1c, and the electronic converter is referred to in the specification and now also in the claims, as a power electronic load. The alternating current synchronous externally excited generator and the electronic converter having control over the frequency as recited in claim 20 features in Fig. 1d and 1e, the electronic converter has been referred to in the specification, and now also in the claims, as the power electronic load or the generator excitation controller, depending on its specifics.. The electronic converter having positive incremental resistance as recited in claim 21; the electronic converter has been referred to in the specification, and now also in the claims, as the power electronic load, this features in Figs.1a, 1b, 1c, 6, 7 and 8. The power electronic converter being a boost converter with a switching element having control over current/voltage relationship as recited in claim 25; this claim has been rewritten, also, the electronic converter has been referred to in the

specification, and now also in the claims, as the power electronic load, and it features as a boost converter in Fig. 8a. The control mechanism comprising variable resistance as recited in claim 26 now features in Fig. 1g. The control mechanism comprising variable resistance including a plurality of fixed resistors as recited in claim 30 now features in Fig. 1f as resistive loads 77.. The variable resistors comprising variable resistance heaters also features in Fig. 1f, although a little imagination may be required to see the zigzag resistive loads 77 as resistive heaters. The sensor as recited in claim 44 has been inserted into Figure 9b, referred to as a rotor position sensor, but could be any position sensing mechanism. The rotary angle transducer and the piston position sensor as recited in claim 46 have been withdrawn directly from the claims, and have been generally referred to as a position sensing mechanism that features in Figure 9b, as mentioned. The brush commutated direct current generator as recited in claim 47 is one embodiment of Figure 1b and 1f and features as generator 15. The boost and buck converter located between the generator and the energy storage as recited in claim 48 has been rewritten to be connected as opposed to physically located, between the generator and the energy storage, and features in Fig. 8b. The converter and generator combination acting as an electronic flywheel as recited in claim 49 has been deleted, without prejudice, from the claims. The receptor as described in claim 50 has been deleted while the input introduced into claim 1 features as input 65 in Fig 1a, and other embodiments. The generator being a brushless direct current motors modified with backdiodes, as recited in claim 52 has been deleted without prejudice from the claims.

In light of all these changes to the claims and to the drawings, as well as numerous figure references that have been added throughout the specification, applicant requests that the objections of the Examiner to the drawings be withdrawn.

SPECIFICATION

The specification stands objected to as failing to provide proper antecedent basis for the claimed subject matter. The claim language is described as being broad and disconnected from content of specification. Corrections have been made to both the claims, and to the specification.

For example:

Limitations like controllably adjustable torque requirement to effect a resultant speed of the rotating mechanical power as recited in claim 1. This claim has been rewritten to draw on language from the specification, such as "an input for signaling a system power output requirement," (page 18, line 28-29) "adjustable torque load" (as described on page 14, line 9, and page 15, line 23, and page 15 line 30, and page 17 line 29) and "system power output requirement" (page 17, line 6 and page 17, line 4). "a product of prime mover rotational velocity and torque" (page 17, line 8-9).

The controllably adjustable torque requirement as recited in claim 2 - this expression has been rewritten as "adjustable torque load", as described above, to draw on language from the specification.

The input for receiving signals commanding power magnitude requirements as recited in claim 3 - this claim has been rewritten. The input has been folded into claim 1. This is supported in the specification on page 18, line 28. Signals are mentioned in page 18, line 29. Power magnitude requirements have been changed to system power output requirements, which has support in (page 17, line 6) and (page 17, line 4).

Look up tables as recited in claim 4, these were generally referred to in the specification as "graphical or mathematical techniques". This term is now used in the claims in place of look-up tables, which have been deleted without prejudice.

The variable mechanical advantage coupling as recited in claim 11 has been deleted without prejudice from the claims, and a claim including gearing has been substituted, to refer to language used in the specification "gearing or other speed changing apparatus".(page 13, line 21).

The variable displacement pump and the displacement adjuster as recited in claim 12 - these have been deleted without prejudice from the claims.

The sensor as recited in claim 44 has been rewritten as a position sensing mechanism, to draw on language used in the specification (page 34, line 16), and as a rotor position sensor (page 33,line 10). As mentioned in the specification, many embodiments will not require this sensor, but some may benefit from it. The sensor has also been added to the diagrams.

The boost and buck converter located between the generator and the energy storage as recited in claim 48 - this claim has been modified. The boost converter is described in

the paragraph beginning on page 29, line 25. The addition of the buck converter is described beginning on page 30 line 3. Boost and buck converters and combinations of boost and buck converters, are well known in the art.

The converter and generator combination acting as an electronic flywheel as recited in claim 49 - This concept has been mentioned in the specification on page 39, line 24, and described in the section above that. The claim has been modified to reflect the wording in the specification.

The receptor as described in claim 50. This has been deleted without prejudice from the claims.

The generator being a brushless direct current motor modified with backdiodes as recited in claim 52 - this claim has been rewritten.

Applicant has made multiple changes to the claims to enable them to draw on language used in the specification, and requests that the objection as failing to provide proper antecedent basis for the claimed subject matter will be withdrawn.

CLAIM REJECTION 35 U.S.C. 112, FIRST PARAGRAPH

Claims 1-77 stand rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time that the application was filed, had possession of the claimed invention. Applicant respectfully traverses. The claims have now been modified to reflect language used in the specification. In the few cases in which features were not described in detail in the specification, these have been deleted without prejudice, from the claims. Specifically,

The control mechanism connected to the mechanical load and comprising control over a controllably adjustable torque requirement, this claim has been substantially reworded. The mechanical load has been termed a generator, without prejudice, and the 'controllably adjustable torque requirement' has been shortened to "adjustable torque load", which is described in the specification (eg page 18, line 32).

The look-up tables have been replaced, without prejudice, with "graphical or mathematical techniques", which is described in the specification (page 22, line 1).

The ideal torque requirement has been deleted as a term from all of the claims.

The variable mechanical advantage coupling has been replaced in the claims with "gearing", without prejudice. Gearing appears in the specification of page 13, line 21.

The variable displacement pump and the displacement adjuster, as recited in claim 12, have been deleted from the claims, without prejudice.

The sensor as described in claim 44 has been more clearly described in the specification as position sensing mechanism. This has support in the specification on page 34, line 16.

The rotary angle transducer, as recited in claim 45 has been deleted without prejudice from the claims.

The piston position sensor as recited in claim 46 has been reworded as a rotor position sensor and draws support in the specification from page 33 line 10 and page 34, line 16.

The boost and buck converter located between the generator and the energy storage as recited in claim 48, this combination is described in the specification on page 30, line 3.

The converter and generator combination acting as an electronic flywheel, this claim has been modified and draws support in the specification on page 34, lines 7-10.

The receptor as described in claim 50 has been deleted without prejudice from the claims.

The generator being a brushless direct current motor modified with backdiodes as recited in claim 52, this claim has been deleted without prejudice.

Applicant requests that in view of the amended claims and the above notations, the objection under 35 U.S.C. 112, first paragraph, be withdrawn.

CLAIM REJECTION - 35 U.S.C. SECOND PARAGRAPH.

The claims stand rejected as failing to define the invention in the manner required by 35 U.S.C. 112, second paragraph. Claims 1-77 are rejected as being narrative inform and replete with indefinite and functional or operational language. The structure which goes to make up the device must be clearly and positively specified. The structure must be organized and correlated in such a manner as to prevent a complete operative device. Applicant has amended the claims to overcome the objection based on 35 U.S.C. second paragraph. Specifically,

In claim 1, the multiple objections have been noted and the claim has been fully amended to alleviate the indefinite and functional/operational language.

In claim 2, the multiple objections have been noted and the claim has been greatly amended to alleviate the indefinite and functional/operational language.

Te term "ideal" has been removed throughout the amended claims.

Applicant acknowledges the indefinite language that featured in the previously submitted claims and hopes that the amended claims will overcome the objection.

REQUEST FOR RECONSIDERATION

Applicant acknowledges with appreciation that the Examiner has indicated that claim 6 contains allowable subject matter.

Applicant has amended the Drawings so that they include the required details, and has made appropriate corrections in the "Brief Description of the Drawings" and in the "Detailed Description of the Invention".

Applicant is amending all the claims so that they contain subject matter described in the specification.

No new matter is added by these amendments and cancellations and they are fully supported by the specification as filed. Applicant respectfully requests entry of these amendments and cancellations. Further, applicant respectfully requests that the Examiner reconsider the above-captioned patent application in view of the foregoing amendments and the following remarks.

CLAIM REJECTION - 35 U.S.C. 102 - Hubler

Claims 1-3, 13, and 14 are rejected under 35 U.S.C. 102(b), as being anticipated by Hubler (US 5,311,063) since Hubler discloses a prime mover output control system comprising a mechanical load 18 connected to a prime mover, a control mechanism 20 connected to the mechanical load and comprising control over the controllable adjustable torque requirement to change the speed of the rotating mechanical power. Applicant respectfully traverses.

Hubler requires for his invention, a filter means for reducing electrical noise, and first, second and third relay means and a selector switch. He furthermore recommends the use of

the Sturdy engine, which requires throttle operation. In fact, in claim 4 he claims "dynamically controlling the engine throttle speed setting". In contrast, the present invention does not require any filter means, does not discuss reducing noise, and does not need first, second or third relay means nor a selector switch. Also, intrinsically, the control method of the present invention does not require the use of a throttle to regulate engine output, which is implicit in Hubler's invention.

Hubler therefore does not anticipate the present invention.

CLAIM REJECTION - 35 U.S.C 102(b) - Maekawa

Claims 1-11, 13-43, 47, 54-58, 60-64 and 72 stand rejected under 35 U.S.C. 102(b) as being anticipated by Maekawa (US 5,703,410). Maekawa discloses a prime mover output control system comprising a mechanical load in form of a generator 7 connected to a prime mover 6, a control mechanism3 connected to the mechanical load and comprising control over the controllably adjustable torque requirement to change the speed of the rotating mechanical power, and a calculator 14 comprising data related to torque requirement/prime mover power output relationships, a battery (re column 2, lines 56-57) Applicant respectfully traverses.

The claims of the Maekawa patent clearly suggest that his invention is directed to a different sort of invention. Firstly, he clearly claims a throttle valve, for regulating a quantity of intake air supplied to an internal combustion engine; and an engine control means for controlling a quantity of fuel to be injected to said engine and an ignition timing therefore; an actuator for adjusting an opening degree of said throttle valve. In contrast, applicant's invention does not require a throttle as an intrinsic part of the operating regime, except perhaps for emergencies or total shutdown. In applicant's invention, the engine is allowed to accelerate or decelerate according to its load conditions, towards a synchronous speed with the generator. Maekawa, however, insists that it is an advantage to keep the rotation speed of the crankshaft to be constant. In his last paragraph of his Description of Related Art, just before he begins his Summary of the Invention, he decries that prior art systems are "providing a difficulty in controlling the rotation speed or number of the crank shaft to be constant, to another disadvantage". In his Summary of the Invention, he seeks to provide an engine generator control system that co-ordinates between excitation control and fine correction of the angle of lag of the ignition. In his second embodiment he describes "...it is desirable upon transient lowering of the output power of the

engine generator, the ignition timing of the engine is controlled with a corrected angle of ag to lower temporarily the output torque Te of the engine 6, to thereby suppress the rotation number from increasing steeply and ensures the constant control of the rotation number Ne of the crank shaft of the engine 6 at a desired rotation number N.sub.0" (see paragraph beginning "Such being the circumstances" in the middle of the section entitled Embodiment 2.)

In Maekawa's Summary of the Invention he describes in the paragraph beginning "In view of the above" how the electronic controller works. Firstly, it has control over the exciting current of the engine generator, of the engine control means, and the actuator (controlling the throttle and associated parts). The desired total output power is determined. The speed of the crankshaft and the load voltage are taken into account. A desired torque is calculated on the basis of the non-negotiable crankshaft speed and the desired total power output, and the control over the exciting current is to ensure that this desired torque is what is actually demanded from the engine. This setup ensures that fluctuations at the generator output end do not affect the speed of the engine which may then run at a maximum output efficiency speed.

In the next paragraph, Maekawa writes: "With the arrangement of the engine generator control system described above, a constant torque control of the engine generator can be realized such that the output power of the engine generator coincides with the desired output power by controlling the exciting current supplied to the engine generator on the basis of the load voltage and the rotation number or speed of the crank shaft even when the output voltage of the engine generator changes in dependence on the status of load, so long as the engine generator is in the state capable of generating the rated power."

In other words, control of the exciting current ensures that the actual generator output is the same as the desired generator output, and that this control also takes into account variations in load voltage.

He continues "Thus, the torque required to be generated by the engine can be controlled to be constant without the need for controlling the throttle valve."

In other words, the torque demanded by the generator from the engine is set to be constant all the time, so that it does not adversely affect the rotation number of the crankshaft. Changes in desired generator output within the range of engine total power output at that crankshaft speed are compensated for by changes in the exciting current, and not reflected in the torque demand of the generator from the crank shaft.

He continues: "Further, by controlling the demanded torque of the engine generator to be constant to thereby suppress fluctuation or variation of the engine rotation speed, optimization of the engine operation efficiency, enhanced fuel-cost performance and improved...".

This statement shows how and why he controls the torque demand of the generator from the engine - so as to suppress fluctuation or variation of the engine rotation speed.

In the section labeled Embodiment 1, in the paragraph beginning "A control arithmetic unit" he writes "More specifically, the control arithmetic unit 14 detects the opening degree .theta. of the throttle valve, the rotation number of the crankshaft...the load voltage.. and the exciting current... to thereby control the opening degree .theta. of the throttle valve 4, the exciting current... the fuel injection quantity and the ignition timing of the engine 6 and others".

Although Maekawa uses the word "thereby", this word, which seems a little ambiguous does not imply that the exciting current controls the opening degree of the throttle valve, but that all this detection enables the control over the throttle valve, the exciting current, the fuel injection quantity, etc..

From all these excerpts it will be clear that Maekawa uses a throttle in a specialized way as a basic part of his invention, and does not use the method of the present invention, namely, to use the torque load of the generator to bring about changes in engine speed, and an associated changes in engine torque, and total system output. Instead, in Maekawa, the exciting current is controlled so as to produce a specific torque demand on the engine equal to the torque output of the engine, so as to not negatively perturb the speed of the crankshaft.

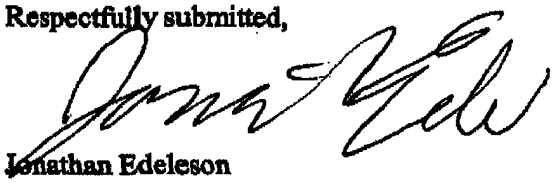
Maekawa discusses how to not disturbing the speed of the crankshaft when one wishes to make power output changes, involving a correcting the angle of lag of the ignition timing, which is completely different from the present invention. Applicant's invention seems similar to Maekawa, in that it discusses maintaining the speed of the crankshaft with regard to fluctuations during the power absorbing and power producing strokes of each engine cycle, etc, and other engine produced perturbations, but applicant's invention recommends designing a load of suitable torque versus speed characteristics which prevents such unwanted phenomena. In contrast to Maekawa, applicant's invention describes using the torque load characteristics to provide the engine with helpful torque to maintain crankshaft speed, and does not involve the step of correcting the ignition timing.

Maekawa therefore does not anticipate the present invention.

CONCLUSION

Applicant respectfully submits that this application, as amended, is in condition for allowance, and such disposition is earnestly solicited. If the Examiner believes that discussing the application the Applicant over the telephone might advance prosecution, Applicant would welcome the opportunity to do so.

Respectfully submitted,



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